

Claims

1. A device for producing plastic plates (12, 21, 23) comprising lugs (14) on at least one side, wherein the lugs (14) are formed integrally with said side, said device
5 comprising

a circulating device (1) and a roll (8) that can be adjusted thereon,

wherein the circulating device (1) comprises at least one straight section (1a) and at
10 least one curved section (1b),

wherein
 - (a) shaping strips (5) are arranged on the circulating device (1),
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 - (b) the shaping strips (5), which comprise on each of their neighboring side walls a corresponding part (6) of at least one recess or one nest (13) for forming the lugs (14), contact each other in the straight section (1a) of the circulating device (1) in such a manner that corresponding recesses (6) of neighboring
20 shaping strips (5) form a closed recess or a nest (13), and
 - (c) the shaping strips (5) open in the curved section (1b) for ejecting the lugs (14).
2. The device according to claim 1, wherein a plastic melt is shaped by extrusion
25 through a slotted nozzle (10) and subsequently passed through at least one roll gap (9) between the circulating device (1) and the roll (8).
3. The device according to claim 1 or 2, wherein the circulating device (1) comprises a chain (2), a band or a belt.
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4. The device according to any one of the preceding claims, wherein the curved section (1b) is circular.
5. The device according to any one of the preceding claims, wherein the temperature of
35 the shaping strips (5) and/or the adjusted roll (8) is controllable or adjustable.
6. The device according to any one of the preceding claims, wherein the shaping strips (5) comprise one or a plurality of individual recesses (6) along their widths.

7. The device according to any one of the preceding claims, wherein, with respect to the plastic plate, the recesses (13) have the shape of upside-down truncated cones.
- 5 8. The device according to any one of the preceding claims, wherein the shaping strips (5) comprise one or a plurality of web- and/or strip-shaped recesses (6).
9. The device according to any one of the preceding claims, wherein the shaping strips (5) are variable and/or exchangeable.
- 10 10. The device according to any one of the preceding claims, wherein the shaping strips (5) are made of dimensionally stable materials such as steel, aluminum and/or the like.
- 15 11. The device according to any one of the preceding claims, wherein the shaping strips (5) are arranged along the circulating device (1) in regular intervals.
12. The device according to any one of the preceding claims, wherein the stress of the circulating device (1) and/or the chain (2), band or belt can be generated and/or
20 adjusted by means of a tensioning device (16).
13. The device according to claim 12, wherein the tensioning device comprises at least a hydraulic cylinder, a spindle lifting gear and/or a pneumatic cylinder.
- 25 14. The device according to claim 12 or 13, wherein the stress causes the shaping strips (5) to contact each other in a force-fitted manner along the straight section (1a).
15. The device according to any one of the preceding claims, wherein, due to a corresponding ratio between reference diameter (D_1) of the circulating device (1) and average diameter (D_m) of the shaping strips (5), the shaping strips (5) which
30 contact each other in the straight section (1a) open in such a manner with respect to each other when passing from the straight section (1a) into the curved section (1b) that they release the lugs (14) formed in the recesses (13).
- 35 16. The device according to any one of claims 1 to 14, wherein the shaping strips (5) which contact each other in the straight section (1a) rest on a wedge-shaped support device (7) so that they open in such a manner with respect to each other when

passing from the straight section (1a) into the curved section (1b) that they release the lugs (14) formed in the recesses (13).

- 5 17. The device according to any one of the preceding claims, wherein the plate is made of polyethylene, polypropylene, polyvinylchloride (PVC), polyvinylidene fluoride (PVDF), ethylene tetrafluoroethylene (ETFE), special types of said materials or a combination thereof.
- 10 18. The device according to any one of the preceding claims, wherein a second film web or plastic plate (23) is supplied to the roll (8) and the circulating device (1) and connected with the plastic plate (12) to form a homogeneous plate.
- 15 19. The device according to any one of the preceding claims, wherein the roll (8) is pivotable in at least two positions (8A, 8B).
- 20 20. The device according to any one of the preceding claims, wherein a nozzle (18) as well as a smoothing system consisting of rolls (19, 20) for producing films and/or plastic plates (21, 23) are arranged in such a manner that the plastic plates can be supplied to the roll (8) in both positions (8A, 8B).
- 25 21. The device according to any one of the preceding claims, wherein at least a second circulating device (1) according to the preceding claims is arranged in such a manner with respect to the first device that the resulting plastic web comprises anchors on both sides.
- 30 22. The device according to any one of the preceding claims, wherein the device comprises means (24, 25, 26) for supplying additives and connecting them with the plastic plate (12, 21, 23).
- 35 23. The device according to claim 22, wherein the additives are flat materials such as a fabric, non-woven material, knitted material, metal foil and/or plastic film.
24. The device according to claim 22 or 23, wherein the additives are drawn in by a roll (8, 19, 20) and connected with the melt of the plastic plate (12, 21, 23).
25. The device according to any one of claims 22 to 24, wherein the additives and/or flat materials are positioned on and/or between the plates (12, 21, 23).

26. The device according to any one of the preceding claims, wherein at least one of the rolls (8, 15, 19, 20) has a profile which is transferred to at least one of the plastic plates (12, 21, 23).
- 5 27. The device according to any one of the preceding claims, wherein the device can be arranged horizontally, vertically or in a specific angle and wherein the melt can be supplied from the top, bottom, side or in a specific angle.
- 10 28. The device according to any one of the preceding claims, wherein the device is arranged in such a manner with respect to a plastic powder application device (27) that directly after formation of the plastic plate (12, 21, 23) its intrinsic energy can be used for achieving an adhesion of the powder to the plate (12, 21, 23).
- 15 29. A method for producing plastic plates (12, 21, 23) which comprise lugs (14) that are integrally formed therewith on at least one side by using a device according to any one of the preceding claims.
- 20 30. The method according to claim 29, wherein a flat molten plastic web is pressed through the gap (9) between the straight section (1a) of the circulating device (1) and the roll (8) adjusted thereon.
- 25 31. A method for producing plastic plates (12) which comprise lugs (14) that are integrally formed therewith on at least one side, characterized in that melt is shaped by extrusion through a slotted nozzle (10) and subsequently passed through at least one roll gap (9) between a circulating device (1) and a roll (8) adjusted thereon,
wherein the circulating device (1) comprises at least one straight section (1a) and at
30 least one curved section (1b),
wherein neighboring shaping strips (5), which comprise along their side walls a corresponding part (6) of at least one recess or nest (13) for forming the lugs (14), contact each other in a closed state at the straight section (1a) of the circulating
35 device (1) in such a manner that corresponding recesses (6) of neighboring shaping strips (5) form a closed recess or a nest (13), wherein the plastic plate (12) and the lugs (14) are formed in the gap (9) and in the recesses (13), respectively, and

wherein in the curved section (1b) the neighboring shaping strips (5) open in such a manner with respect to each other that they release the lugs (14) formed in the recesses (13).

- 5 32. The method according to claim 31, wherein, due to a corresponding ratio between
reference diameter (D_1) of the circulating device (1) and average diameter (D_m) of
the shaping strips (5), the shaping strips (5) which contact each other in the straight
section (1a) open in such a manner with respect to each other when passing from the
straight section (1a) into the curved section (1b) that they release the lugs (14)
10 formed in the recesses (13).
33. A plastic plate (12, 21, 23) comprising lugs (14) and being produced in accordance
with the method according to any one of claims 29 to 32.
- 15 34. A plastic plate (12, 21, 23) comprising lugs (14) and being produced by means of a
device according to any one of claims 1 to 28.